

CLINICAL NOTES AND CASE REPORTS

RADIUM IN LESIONS OF THE FACE

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AT a recent meeting a prominent surgeon stated, "You cannot use radium without destroying the good as well as the diseased tissue." That opinion, seemingly widespread, is erroneous. Radium can be so filtered that diseased tissue only is destroyed, but in order to do that, the time of exposure, as well as the amount of filtration, must be correct. Destruction, in this case, is accomplished by the prevention of reproduction rather than by actual necrosis.

Unfiltered radium, it is true, destroys all tissue, and when so used as a simple destructive agent, is inferior to the actual cautery because it is not so definitely controlled. On the other hand, when it is desired to destroy only the pathologic tissue and cause no visible scar, radium must be so filtered that the rays of longer wavelength are stopped by the filter, and only those of a shorter wavelength are allowed to pass and act on the tissues.

The heavier the filtration the more nearly the efferent rays are of the same wavelength. As a result of this homogeneity, the time of application becomes the important factor and, by changing the time, different groups of cells in normal skin are destroyed. The epithelial lining of the hair follicles are the most sensitive cells in the skin, and the subcutaneous connective tissue is the most resistant. Assuming the radiosensibility of the skin as 1, the average sensibility of a carcinoma is 0.90 and sarcoma is 0.70. Other abnormal cells vary in susceptibility. Graafian follicles are about five times more sensitive than the skin. In order to get the selective action of radium to its fullest extent, all alpha and beta rays must be cut off and most of the gamma rays of long wavelength. In order to do this with ten milligrams of radium distributed over an area of one square centimeter,



Fig. 3.



Fig. 4.

Fig. 3.—Seborrheic keratosis, destroyed without scar formation by 10 milligrams of radium filtered with one millimeter of gold and one millimeter of lead. Length of application was twenty-four hours.

Fig. 4.—Same as Fig. 3, several months after treatment.

a filtration of one millimeter of gold and one millimeter of lead will result in allowing approximately 25 per cent of the soft gamma rays and 93 per cent of the hard gamma rays to pass and be absorbed by the tissue. The soft gamma rays are



Fig. 5.

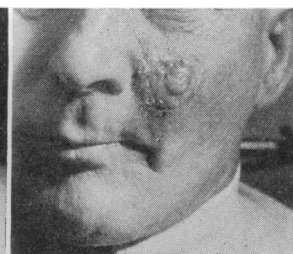


Fig. 6.

Fig. 5.—Basal-cell epithelioma. Ten milligrams of radium was applied for twenty-four hours, filtered with one millimeter of gold and one millimeter of lead.

Fig. 6.—Same as Fig. 5, but twenty days later. Shows no destruction of normal tissue.

those which are totally absorbed by 20 millimeters of lead, and the hard gamma rays are those which all pass through 20 millimeters of lead. Such heavily filtered radium requires a longer or shorter period of application according to the amount of radium used. Some 240 milligram hours of



Fig. 1.



Fig. 2.

Fig. 1.—Basal-cell epithelioma, destroyed by 10 milligrams of radium filtered with one millimeter of gold and one millimeter of lead. Time, twenty-four hours.

Fig. 2.—Same as Fig. 1, showing absence of scar formation.



Fig. 7.



Fig. 8.

Fig. 7.—Epithelioma of five years' duration. Fifty milligrams of radium was applied in two different places for periods of eighteen hours each. Total area of the radium was about six square centimeters. Filtered with one millimeter of silver and one millimeter of lead and four millimeters of wax.

Fig. 8.—Same as Fig. 7, but taken thirty-six days later. Shows destruction of pathologic tissue only.

radium filtered as above can be used without permanent destruction of normal cells, and basal cell carcinomas will be destroyed by that dose.

The minimum requirement to filter out the alpha and beta rays is 10 millimeters of aluminum, 2 millimeters of lead, .7 millimeters of gold, or .6 millimeters of platinum. Paraffin, rubber, and other organic filters, have very little effect in stopping any of the rays; 20 millimeters of these substances allow from 91.2 to 97.8 percent of the hard gamma rays to pass. The above statements are worked out from the tables of Albert Laborde, and are based on the coefficient of absorption of the various substances.

The submitted photographs of pathologic conditions of the face are selected from many similar good results, all treated by the principles as stated above.

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PUERPERAL PEMPHIGUS*

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ACUTE pemphigus occurring in the puerperium is rare. The cutaneous manifestations of puerperal septicemia are usually purpura, petechiae, and scarlatiniform erythema. The rarest cutaneous findings are bullae, papules, and urticarial lesions. Little reference, however, to acute pemphigus occurring during the puerperium is to be found in the literature.

REPORT OF CASE

Mrs. E. C., aet. 31, was admitted with the diagnosis of pregnancy, full term; pyelitis. The patient had complained of bladder distress one month before her admission. The urine at that time contained 2 plus albumin, and 20 to 30 leukocytes per high dry field. A diagnosis of pyelitis was made.

On August 6 the patient was delivered of a living male child. A perineorrhaphy was performed at the time of delivery.

On August 8 the temperature rose to 100.9 degrees Fahrenheit, and a large bleb, 2 centimeters in diameter, appeared on the inner surface of the left thigh. Small blebs appeared in large numbers, chiefly over the buttocks. Pus appeared at the lower angle of the episiotomy wound.

On August 12 the temperature was 104 degrees Fahrenheit, and a new crop of bullae appeared. Culture from a cutaneous bleb showed a growth of *Staphylococcus aureus*.

An August 13 bullae appeared on the ears and on the anterior chest. The patient's face was cyanotic and she became comatose. The temperature elevated from 105 to 107 degrees Fahrenheit, and was followed by a severe chill. Examination of the blood showed: hemoglobin, 63 per cent (Sahli); erythrocytes, 3,160,000; leukocytes, 19,600; polymorphonuclears, 92 per cent; lymphocytes, 7 per cent; basophiles, 1 per cent; coagulation time, seven minutes.

On August 14 the temperature was 105 degrees Fahrenheit, and the patient again had a severe chill. The outer layers of the epidermis became loose and detached. A diffuse vesiculo-bullous eruption covered most of the trunk and the extremities. Large areas of denuded skin with a raw, erythematous surface were present. The bullae and vesicles were thin-walled, and could be easily broken. A positive Nickolsky sign was elicited.

On August 15 more than one-half of the body surface was denuded of epidermis. The face was red, dry, and

scaly. Examination of the blood showed: hemoglobin, 45 per cent; erythrocytes, 2,630,000; leukocytes, 27,250; polymorphonuclears, 94 per cent; lymphocytes, 2 per cent; myelocytes, 4 per cent.

On August 20 the patient's coma deepened. The temperature elevated from 105 to 108 degrees Fahrenheit before death. The cultures of the fluid from the bullae again grew *Staphylococcus aureus*.

Necropsy Findings.—The superficial skin was almost entirely removed, and a few bullae were present. There were large denuded cutaneous areas. Examination of the lungs showed adhesions at the apices and hypostatic congestion in each lower lobe. An embolus was found in a vessel of the lower right lobe. Examination of the heart revealed a vegetative growth on the anterior flap of the mitral valve. The growth was in the flap and measured five-tenths centimeter in diameter. The spleen was enlarged, dark colored, and soft. The kidneys were soft, edematous, and swollen. Each kidney pelvis was slightly enlarged and congested. Stripping the kidney capsule showed minute abscesses scattered over the kidney surface. The ureters were slightly enlarged and thickened.

The urinary bladder mucosa was edematous, congested, and had hemorrhagic areas at the trigone. The liver was enlarged, and small grayish discolorations could be noted through its capsule. Section through these discolorations showed abscesses near the surface. The liver lobulations were swollen and considerably obscured. The gall-bladder, adrenals, pancreas, stomach, and intestines were normal.

The uterus was small, involuted, and contained thrombosed vessels. A small amount of grayish exudate was on its mucus surface.

Anatomic Diagnosis.—The anatomic diagnosis was septicemia; pyelitis; cystitis; suppurative hepatitis; suppurative nephritis; chronic fibrous adhesions, apices of lungs; embolus, right lung, lower lobe; acute endocarditis, mitral; pemphigus.

The spleen cultures grew *Staphylococcus aureus*; a smear from the uterus showed many Gram-positive diplococci resembling staphylococci; a few streptococci were present.

The microscopic sections corresponded with the gross pathologic findings. The endocarditis seemed to be an acute exacerbation of an old fibrous condition. The liver presented a typical nutmeg appearance outside of the suppurative areas. The pathologist expressed the opinion that the patient had had an acute infection in the past which had lain dormant until the present crisis produced an acute exacerbation.

COMMENT

Brocq¹ has classified acute pemphigus of the reported type under the title, "Acute Infectious Bullous Dermatitis," while Pernet and Bullock² described the condition as "Acute Febrile Grave Pemphigus." The septic wounds preceding acute pemphigus have been reported to be produced in some cases by dead animal material or by animal bites. Butchers and handlers of dead animals usually suffer from this type of acute pemphigus. Vaccination wounds³ have also been reported to precede acute pemphigus. Little reference is to be found, however, to acute pemphigus occurring in the puerperium. The infected perineal wound or, more probably, an infection in the involved internal organs may have been the source of the infection in my patient. *Staphylococcus aureus* was cultured from both the cutaneous lesions and the internal organs.

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¹ Brocq: *La Pratique Derm.*, p. 761, 1902.

² Pernet and Bullock: *Brit. J. Dermat.*, 8:157, 1896.

³ Howe: *J. Cutan. Dis.*, 21:254, 1903.

* From the Hollywood Hospital.